Mainstreaming Climate-Smart Conservation in State Natural Resource Policy and Programs

Zoë Johnson, Office for a Sustainable Future

Climate Resilience: Mitigation + Adaptation

Mitigation

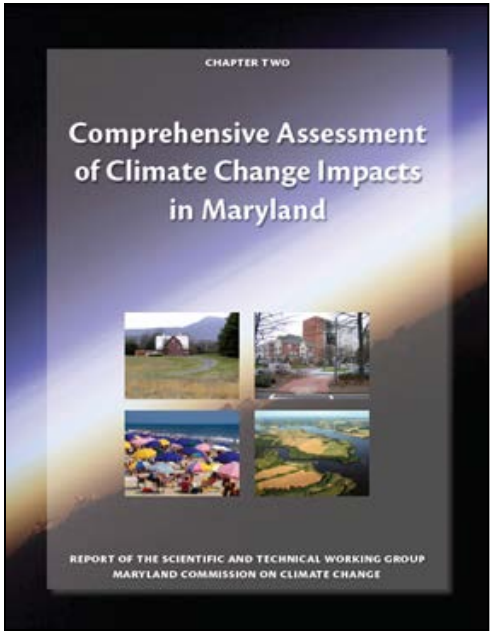
Reducing greenhouse gas emissions in order to slow or stop global climate change.

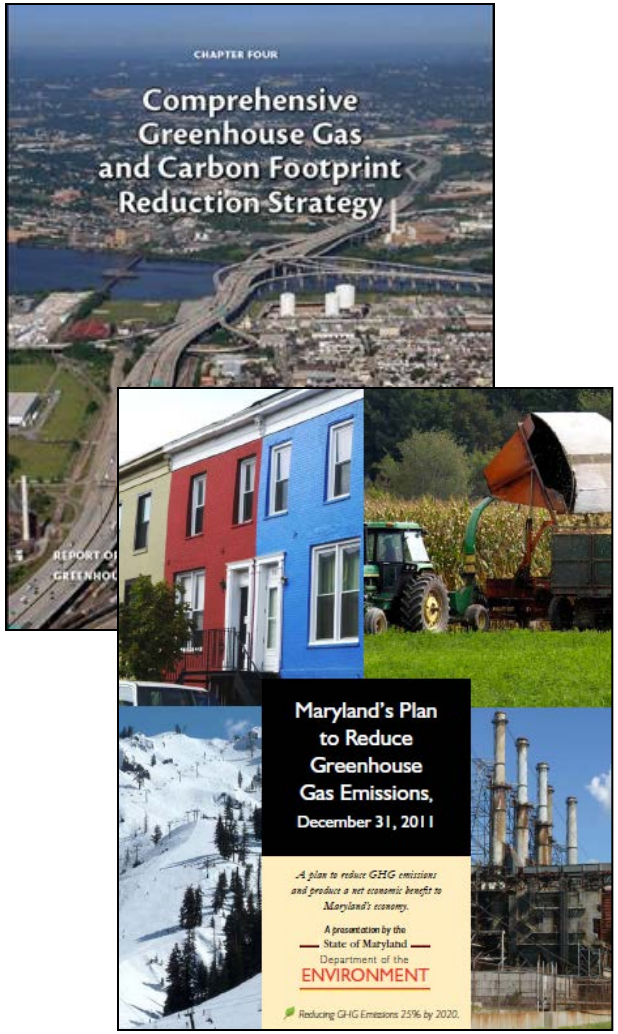
Adaptation

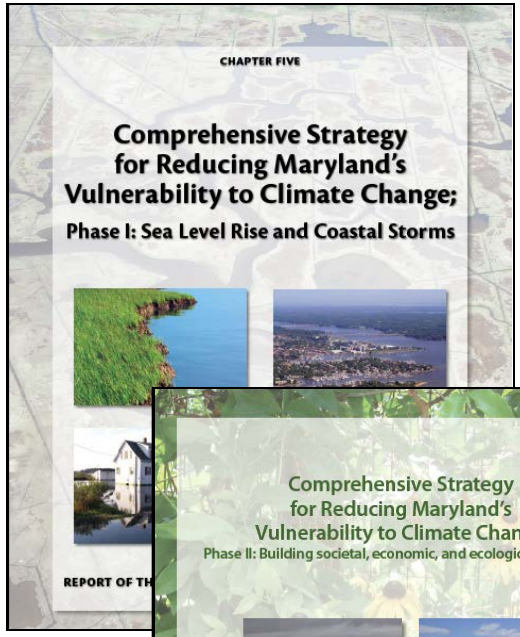
Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

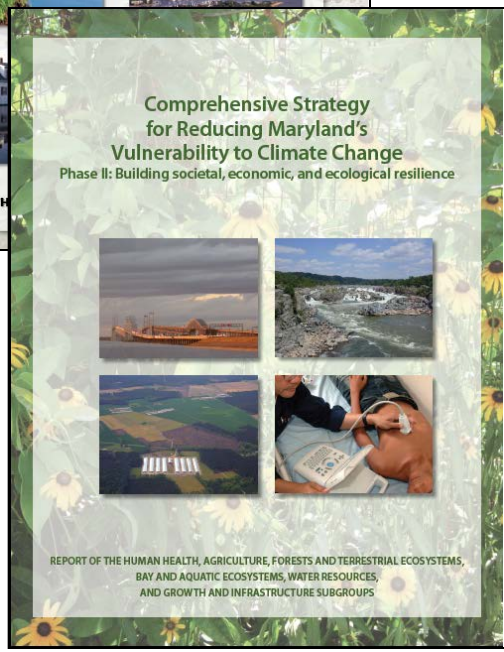
UKCIP (2008)

Maryland's Climate Action Plan







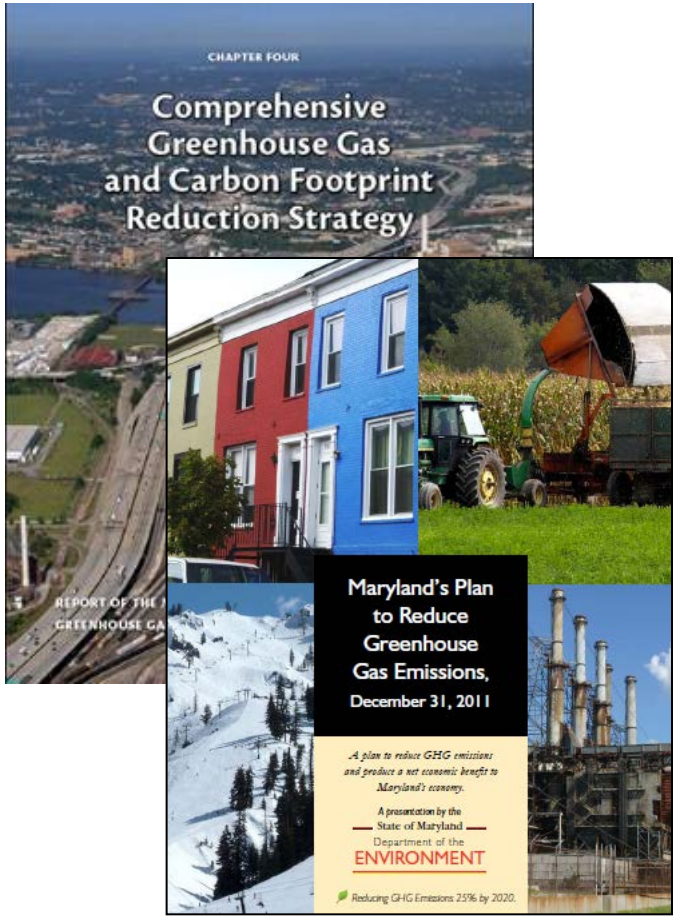


Maryland's Greenhouse Gas Reduction Act

Reduce Maryland's Statewide Greenhouse Gas Emissions by 25% by 2020

Natural Resource-Related Strategies

- Managing Forests to Capture Carbon
- Creating Ecosystems Markets to Encourage GHG Emissions Reductions
- Increasing Urban Trees to Capture Carbon
- Creating and Protecting Wetlands and Waterway Borders to Capture Carbon
- Geological Opportunities to Store Carbon
- Planting Forests in Maryland
- Expanded Use of Forests and Feedstocks for Energy Production



Climate Adaptation: Sector-by-Sector

Adaptation Planning Process

Review state of the science

Assess climate vulnerability

Identify critical information gaps

Consider and prioritize key issues of concern

Explore potential adaptation strategies

Evaluate adaptation infrastructure (institutional framework)

Identify opportunities & mechanisms to affect change

Recommend action strategies (short, medium long-term)

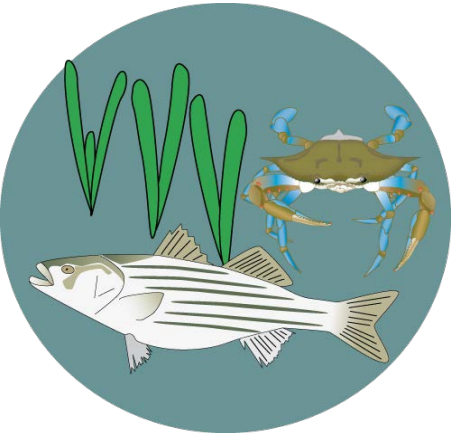
Phase I Strategy
Recommended Adaptation Options

Vision: Protect and restore the State's natural shoreline and its resources, including its tidal wetlands and marshes, vegetated buffers, and Bay Islands, that inherently shield MD's shoreline and interior.

- Install "Living Shorelines" or non-structural shore protection practices to deal with erosion
- Increase vegetative or forested buffers
- Use erosion or elevation-based setbacks to site structures
- Designate and protect wildlife habitat and wetland migration corridors

Phase II Strategy
Recommended Adaptation Options

Vision: Increase ecosystem resilience to gradual change and extreme events



- Advance protection of at-risk species and habitats.
- Restore critical bay & aquatic habitats to enhance resilience.
- Reduce existing stressors.

- Expand land protection and restoration and revise targeting priorities
- Adjust management practices
- Foster stewardship on private lands.

Implement Priority Adaptation Actions

Forests and Terrestrial Ecosystems

	Priority Recommendations	Lead Agency	Key Partners	Priority	Timeframe	Potential Cost
Expand land protection and restoration and revise targeting priorities.	Integrate climate data and models into existing resource assessments and spatial planning frameworks.	DNR	EPA, CBP, USDOI, USFWS, NGOs, NASA, NOAA	high	medium-term	medium
	Incorporate climate change adaptation strategies into State resource management plans.	DNR	MDP, EPA, CBP, USDOI, USFWS, NOAA, USFS, NGOs	high	medium-term	low
	Collaborate with federal partners to support regional and national adaptation planning.	DNR	EPA, CBP, USDOI, USFWS, NOAA, USFS, NGOs	medium	medium-term	low
	Update existing land protection targeting programs and project evaluation protocols.	DNR	EPA, CBP, USDOI, USFWS, NOAA, USFS, NGOs	high	ongoing	medium
	Develop climate change adaptation guidance and technical tools suitable for local government planning.	DNR	MDP, UME	high	ongoing	medium
Adjust management practices and reduce existing stressors.	Strengthen State and local programs to slow the loss and fragmentation of forest and terrestrial ecosystems to new development.	DNR	MDP, MDE, MDOT, USFWS, USFS, EPA, CBP, NGOs	high	ongoing	medium
	Review and revise forestry best management practices.	DNR	UME	medium	medium-term	medium
	Continue to support incorporation of the policies and strategies of Maryland's Sustainable Forestry Act of 2009 into State and local planning decisions.	DNR	State Forest Conservancy District Boards	high	ongoing	low
	Evaluate sustainable forestry certification programs for opportunities to enhance climate resilience.	DNR	Sustainable Forestry Initiative, Forestry Boards, Forest Stewardship Councils	medium	medium-term	medium
	Improve capacity to manage and respond to stressors exacerbated by climate change.	DNR	MDA, MD Invasive Species Council, Forest Health Emergency Contingency Program	medium	short-term	high
Foster stewardship on private lands.	Develop new tools to guide adaptation stewardship activities on private lands.	DNR	Forest Stewardship Councils, UMD Extension	high	short-term	medium
	Incorporate adapatation concerns into existing programs.	DNR	USFS, Forest Stewardship Councils, UMD Extension	high	short-term	medium
	Develop new conservation easement mechanisms to promote adaptation stewardship activities on private lands.	DNR	USFS, Forest Stewardship Councils, UME, MDA	high	ongoing	low

"Mainstreaming" Climate Smart Conservation

New State Policy

- Living Shoreline Protection Act (2008)
  - Requires non-structural shore protection practices unless proven infeasible
- Chesapeake & Coastal Bays Critical Area Amendments (2008)
  - Increased vegetative buffers
  - Updated jurisdictional boundaries to account for sea level rise
  - Allows for consideration of coastal impacts during growth allocation decisions

Lead by Example Policy

Building Resilience to Climate Change

DNR policy to guide investments in and management of land, resources and assets so as to better understand, mitigate and adapt to climate change.

- New Land Investments
- Facility Infrastructure Siting & Design
- Habitat Restoration
- Research & Monitoring
- Resource Planning
- Government Operations
- Advocacy

Intent: Through implementation of this policy, DNR will guide its own actions, and will lead by example, encouraging our sister agencies and local government leaders to plan for and to mitigate the effects of climate change.

Habitat Restoration Policy

- Practice: DNR shall proactively pursue, design and construct habitat restoration projects to enhance the resilience of bay, aquatic and terrestrial ecosystems to the impacts of climate change and/or increase on-site carbon sequestration.

- Procedure: DNR units that engage in habitat restoration projects shall address and incorporate factors associated with climate change during project planning and design processes, including maintenance and monitoring needs.

- Implementation Guidance: DNR's Watershed Services Unit shall compile a compendium of best management practices for habitat restoration project design and shall conduct a GIS-based audit of DNR-owned lands to identify habitat restoration potential for enhancing ecosystem resilience and/or increasing on-site carbon sequestration, within 12 months of the effective date of this policy.

Land Investment Policy

- Practice: DNR shall proactively seek the protection of lands that enhance the resilience of bay, aquatic and terrestrial ecosystems and/or mitigate the impacts of climate change through on-site carbon sequestration.

- Procedure: DNR's Land Acquisition and Planning Unit shall review all proposed land acquisitions and conservation easements to: (1) assess potential impacts of climate change and sea level rise; and (2) identify landscape or site-level characteristics that support ecosystem resilience. Limitations on future use of the site and opportunities to increase resiliency and/or mitigate adverse impacts shall be considered in combination with other existing land conservation evaluation criteria.

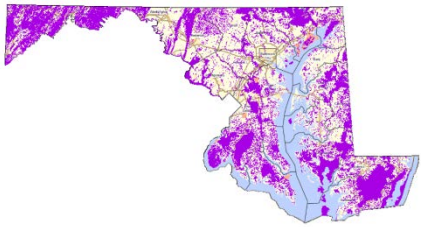
- Implementation Guidance: DNR shall develop specific land conservation-climate change evaluation criteria within 12 months of the effective date of this policy.

Targeted Ecological Areas

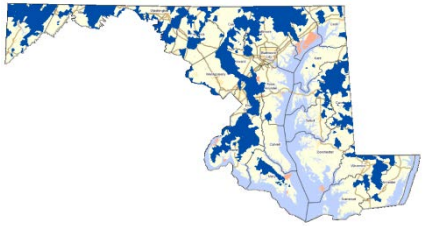
Best of the Best

Green Infrastructure and Important Forests

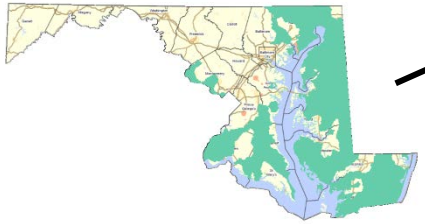
Wildlife and Rare Species Habitat

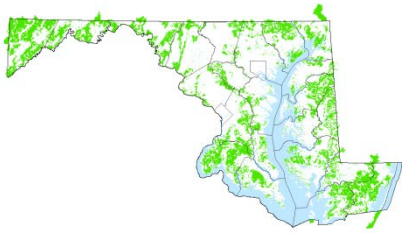


Non-tidal Streams and Fisheries



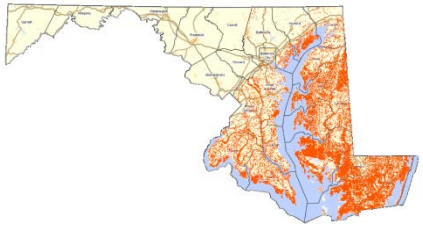
Tidal Fisheries, Bay and Coastal Ecosystems





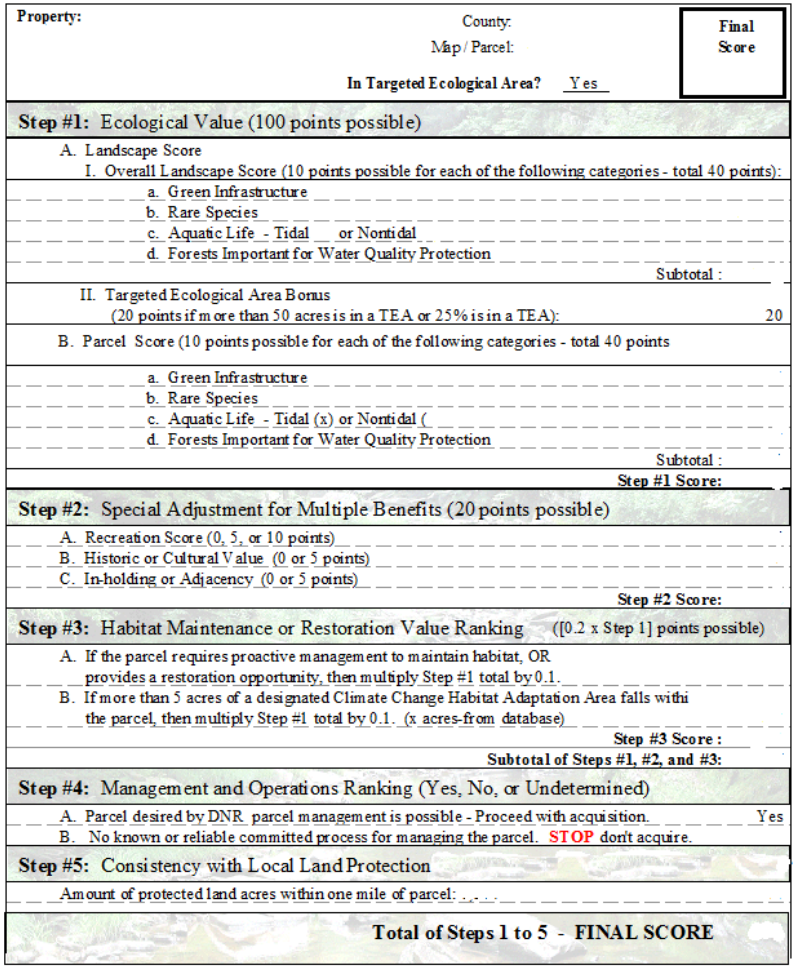
Targeted Ecological Areas

Wetland Adaptation Areas



Implementation Mechanisms

- *Greenprint* Targeted Ecological Area 2011 Update
  - Addition of "wetland adaptation areas"
  - Removal of lands less than 2 feet above MSL
- *Community Connections*
  - Incorporates Climate Change Scoring Criteria
- Model Easement Language
  - Inclusion of model language for Climate Change Adaptation (restrictive and affirmative) and Mitigation



Property: County: Map / Parcel: **In Targeted Ecological Area?** Yes — **Final Score**

Step #1: Ecological Value (100 points possible)

A. Landscape Score
I. Overall Landscape Score (10 points possible for each of the following categories - total 40 points):
a. Green Infrastructure
b. Rare Species
c. Aquatic Life - Tidal or Nontidal
d. Forests Important for Water Quality Protection
Subtotal :
II. Targeted Ecological Area Bonus
(20 points if more than 50 acres is in a TEA or 25% is in a TEA): 20

B. Parcel Score (10 points possible for each of the following categories - total 40 points
a. Green Infrastructure
b. Rare Species
c. Aquatic Life - Tidal (x) or Nontidal (
d. Forests Important for Water Quality Protection
Subtotal :
Step #1 Score:

Step #2: Special Adjustment for Multiple Benefits (20 points possible)

A. Recreation Score (0, 5, or 10 points)
B. Historic or Cultural Value (0 or 5 points)
C. In-holding or Adjacency (0 or 5 points)
Step #2 Score:

Step #3: Habitat Maintenance or Restoration Value Ranking ([0.2 x Step 1] points possible)

A. If the parcel requires proactive management to maintain habitat, OR provides a restoration opportunity, then multiply Step #1 total by 0.1.
B. If more than 5 acres of a designated Climate Change Habitat Adaptation Area falls withi the parcel, then multiply Step #1 total by 0.1. (x acres-from database)
Step #3 Score :
Subtotal of Steps #1, #2, and #3:

Step #4: Management and Operations Ranking (Yes, No, or Undetermined)

A. Parcel desired by DNR parcel management is possible - Proceed with acquisition. Yes
B. No known or reliable committed process for managing the parcel. STOP don't acquire.

Step #5: Consistency with Local Land Protection

Amount of protected land acres within one mile of parcel: . . .

Total of Steps 1 to 5 - FINAL SCORE

State growth policy

Areas of Special Designation

Climate Change Impact Areas

- Sea Level Rise Vulnerability
- Erosion Vulnerability
- Wetland Adaptation Areas
- Storm Surge Risk
- 100 and 500-Year Floodplain
- Drought Hazard Risk
- Wildfire Priority Risk
- High Quality Cold Water Resource Areas
- Climate Sensitive Wildlife and Rare Species Habitats (coming soon)

http://maryland.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=9ac089621ff247d8b9411554b5edf66f

Infrastructure Investment Policy

Climate Change & "Coast Smart" Construction

- State agencies proposing capital projects for new or reconstructed state structures shall consider the risk of coastal flooding and sea level rise to the project and should site and design structures to avoid or minimize damage.

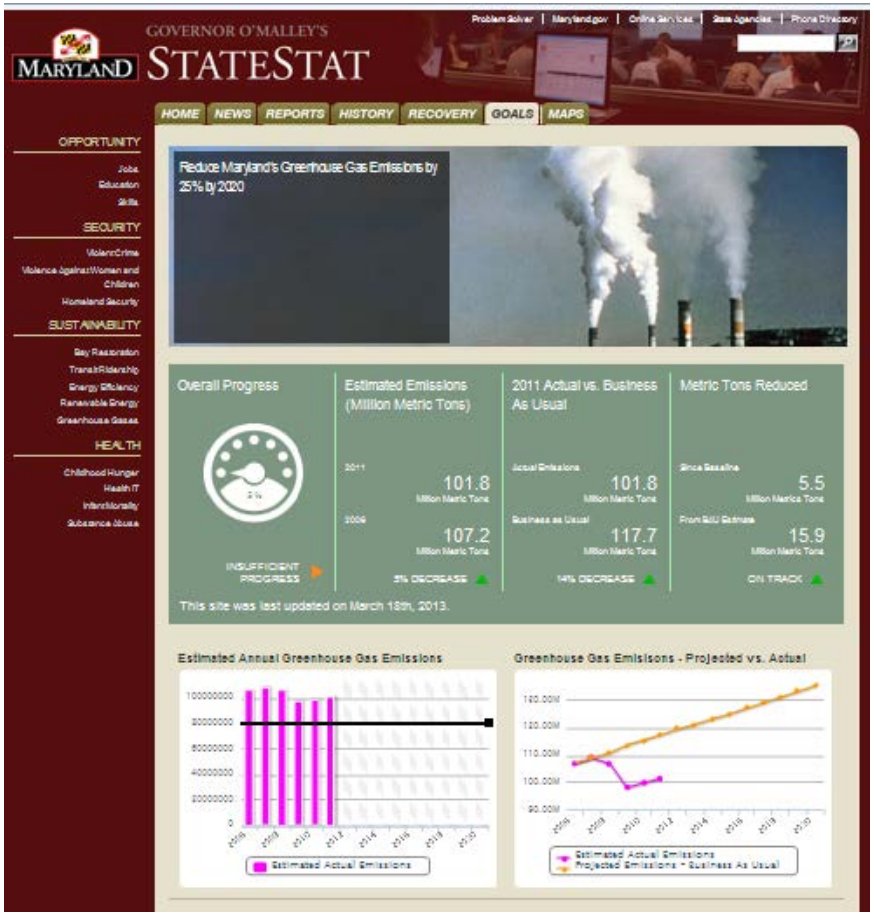
- State agencies shall plan construction and reconstruction of state structures located in Special Flood Hazard Areas with a minimum of two (2) feet above the 100-year base flood elevation.

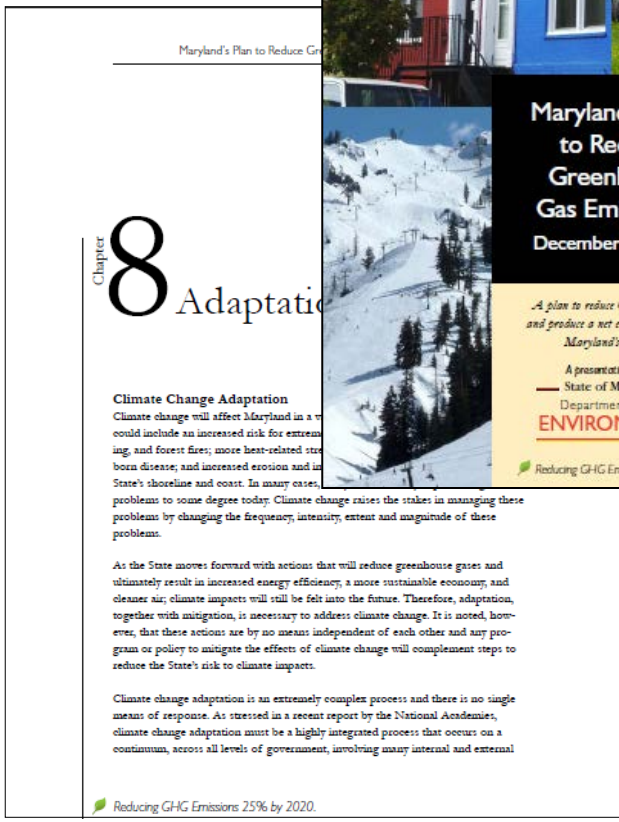
- DNR in consultation with the Maryland Commission on Climate Change and other relevant parties shall develop:
  - Recommendations for additional siting and design of new and reconstructed state structures, as well as other infrastructure improvements.
  - Recommendations concerning the potential application of "Coast Smart" guidelines to non-state infrastructure projects that are partially or fully funded by State agencies.

- The Critical Area Commission should evaluate existing regulations and policies for State Agency actions resulting in development on state-owned lands and consider the adoption of new or revised provisions that address climate change the risk of sea level rise and other extreme weather related impacts.

- The Scientific and Technical Working Group of the Maryland Commission on Climate Change shall provide updated sea level rise projections based on an assessment of the latest climate change science and federal guidance.

Tracking Action Effectiveness





Maryland's Plan to Reduce Gr

Chapter 8 Adaptatio

Climate Change Adaptation

Climate change will affect Maryland in a v
could include an increased risk for extrem
ing, and forest fires; more heat-related str
born disease; and increased erosion and in
State's shoreline and coast. In many cases,
problems to some degree today. Climate change raises the stakes in managing these problems by changing the frequency, intensity, extent and magnitude of these problems.

As the State moves forward with actions that will reduce greenhouse gases and ultimately result in increased energy efficiency, a more sustainable economy, and cleaner air; climate impacts will still be felt into the future. Therefore, adaptation, together with mitigation, is necessary to address climate change. It is noted, however, that these actions are by no means independent of each other and any program or policy to mitigate the effects of climate change will complement steps to reduce the State's risk to climate impacts.

Climate change adaptation is an extremely complex process and there is no single means of response. As stressed in a recent report by the National Academies, climate change adaptation must be a highly integrated process that occurs on a continuum, across all levels of government, involving many internal and external

Reducing GHG Emissions 25% by 2020.

Partnering and Engagement

MARYLAND
Smart, Green & Growing

ccp
Maryland's Chesapeake & Coastal Program

Integration & Application Network

University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Maryland Geological Survey

TOWSON UNIVERSITY
Center for Geographic Information Sciences

WILLIAM & MARY
VIMS
VIRGINIA INSTITUTE OF MARINE SCIENCE
SCHOOL OF MARINE SCIENCE

Sea Grant
Maryland

BURKE
environmental associates

USGS
science for a changing world

MARYLAND EASTERN SHORE
RESOURCE CONSERVATION & DEVELOPMENT COUNCIL

THE CONSERVATION FUND
America's Partner in Conservation

Center for Climate Strategies
Helping States and Nations Tackle Climate Change

NATIONAL WILDLIFE FEDERATION


Thank you.
http://www.dnr.state.md.us/climatechange
MARYLAND
DEPARTMENT OF
NATURAL RESOURCES
Wanda Cole, Maryland RC&D